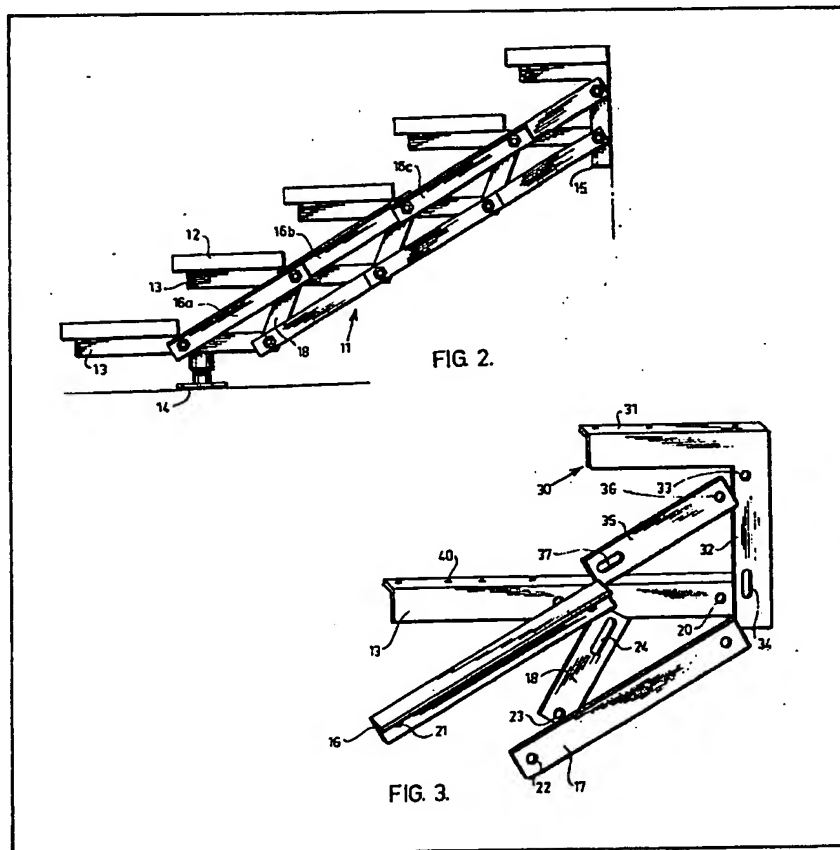


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(54) Framework for staircase or terrace seating

(57) A framework for a staircase or terrace seating, including: top mounting means (15); bottom mounting means (14); a plurality of tread support members (13); a plurality of chord members (16, 17), each pair of chord members being pivotally connectable at one end thereof to a respective one of said tread support members and at the other end thereof to an adjacent tread support member. The pivotal connection enables the staircase to be adjusted in situ by moving the top mounting means and bottom mounting means relative to one another to adjust the staircase span and height.



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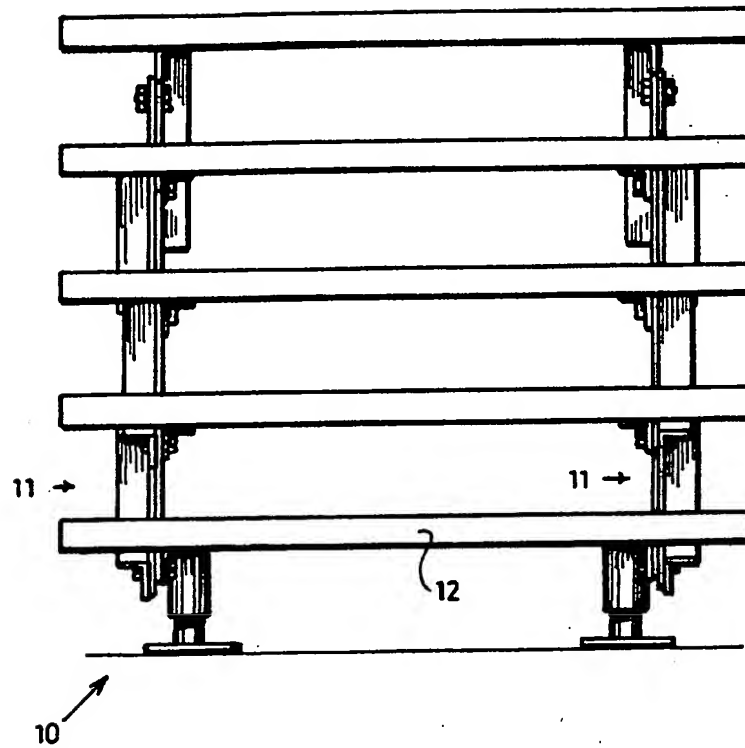


FIG. 1.

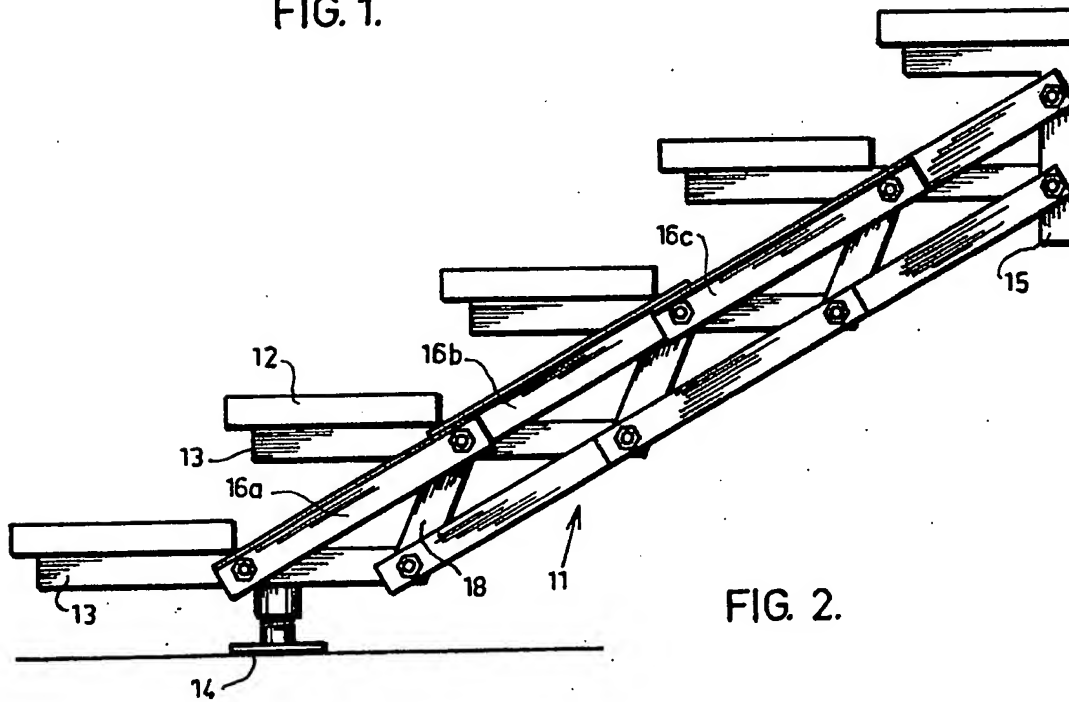


FIG. 2.

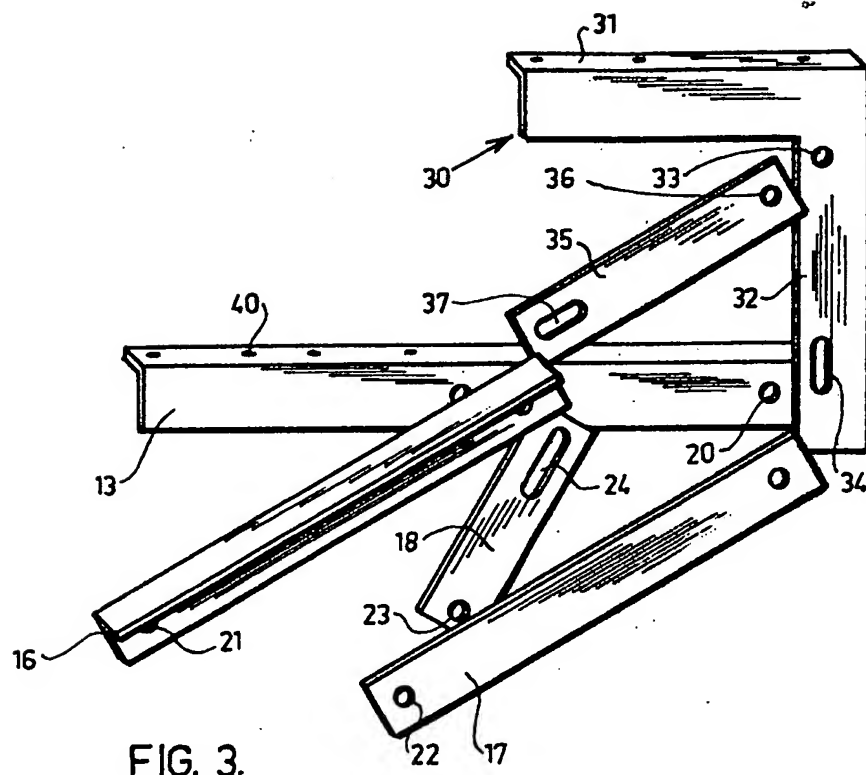


FIG. 3.

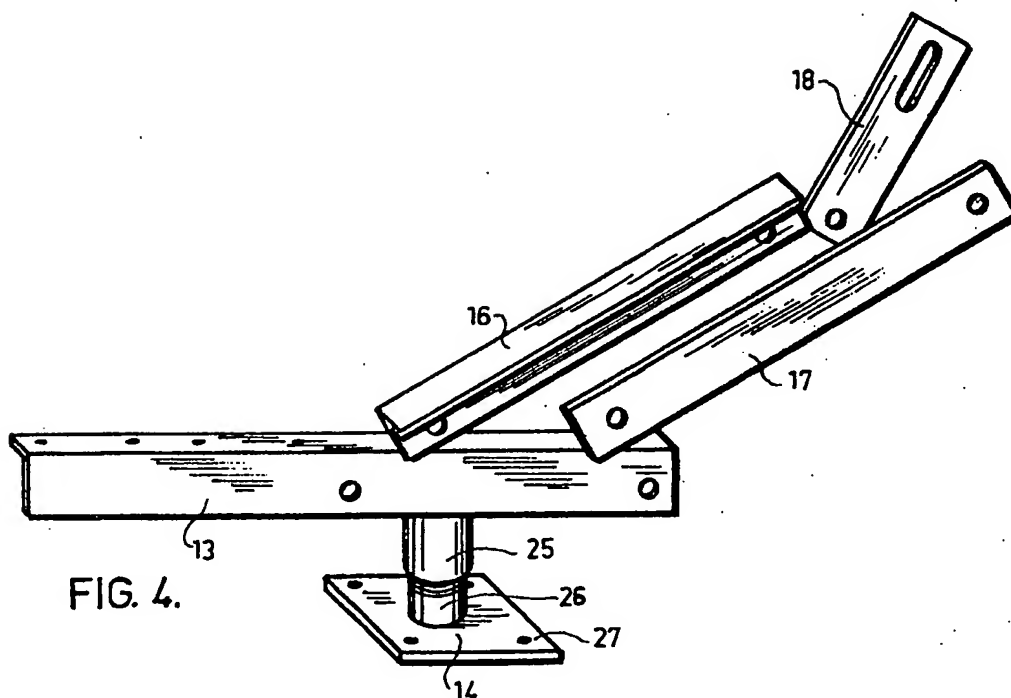


FIG. 4.

## SPECIFICATION

## Framework for staircase or terrace seating

5 This invention relates to a framework suitable for use in building a staircase, or terrace seating or the like.

The building of staircases is time consuming, and hitherto, staircases have been generally made to measure by craftsmen usually on site. Indeed, it has been sometimes necessary to include one or more steps of different riser height to ensure that the staircase spans the required height. This is clearly unsatisfactory.

15 The following patents illustrate various forms of adjustable stairs or staircases:

Ross U.S.P. 2,245,825

Cornell, U.S.P. 3,626,438

Cox, U.S.P. 3,885,365

20 Cox, U.S.P. 3,962,838

Rossman, U.S.P. 3,932,972

Cornell and Cox teach the use of adjustable parallelograms side frames to adjust the pitch of the resulting staircase. However, each of the prior art constructions is limited to the preset length of the side frame and thus the amount of the adjustment is limited.

It is an object of this invention to provide an improved framework and/or staircase, or which will at least provide the public with a useful choice.

In one aspect, the invention provides a kitset framework for a staircase or terrace seating, including: top mounting means; bottom mounting means; a plurality of tread support members; a plurality of pairs of chord arms, each pair of chord arms being pivotally connectable at one end thereof to a respective one of said tread support members and at the other end thereof to an adjacent tread support member; whereby a framework for a staircase or terrace seating can be constructed by interconnecting a plurality of said tread support members between said top and bottom mounting means.

In another aspect, the invention provides a staircase or terrace seating, including: a pair of side frames with stair treads attached at intervals to said side frames; each said side frame including: a plurality of said support members, a plurality of pairs of chord members, each pair of chord members being pivotally connected at each end thereof to adjacent tread support members, and bracing members pivotally connected between adjacent tread support members, bottom mounting means anchoring a lower end of said side frame, and top mounting means anchoring a top end of said side frame; whereby relative movement of said top and bottom mounting means will enable the angle of said staircase and thus the vertical spacing between said treads to be adjusted in situ.

By constructing the framework from a plurality of pivotally connected relatively short members, the resulting framework can be adjusted by moving the top and bottom mounting means towards or away from one another either horizontally or vertically so that the span or height of the staircase can be adjusted without the need for interposing one or

more steps of different riser heights. Thus, the adjustment allows a user to assemble a staircase framework, and to adjust it in situ.

The present invention will now be described by way of example only, with reference to the accompanying drawings, in which:

Figure 1: illustrates a front elevation of a staircase embodying one embodiment of framework of the present invention.

75 Figure 2: illustrates the staircase of Figure 1 in side elevation.

Figure 3: illustrates an exploded view of the upper framework components of Figures 1 and 2.

80 Figure 4: illustrates an exploded view of the lower framework components of Figures 1 and 2.

A staircase 10 is constructed from a framework having a pair of side frames 11. Treads 12 span the side frames, with each tread resting on a pair of tread support members 13. Each side frame has bottom mounting means 14 and top mounting means 15.

The side frames can be constructed from a kitset consisting of a plurality of standard members, and these will be described with particular reference to Figures 3 and 4.

The basic components consist of the tread support members 13, and a plurality of chord members 16, 17. The tread support members 13, and the upper chord members 16 are of angle cross-section, whilst the lower chord members 17 are formed of flat strip. In addition, there are bracing members 18 capable of interconnecting adjacent tread support members, and alternate ends of the chord members, to form diagonal bracing. The tread support members 13 are provided with connection apertures 20, one of which is preferably situated at the inner end of the vertical flange of the tread support members, whilst the second connection aperture 20 is provided about the mid portion of the tread support member, so that a portion of the tread support member will extend beyond the chords of the side frame. Similar connection apertures 21, 22, are provided in each end of the upper and lower chord members 16, 17. The bracing members 18 are provided with a connection aperture 23 at one end, and an adjustment slot 24 at the other end thereof.

The lower mounting means 14 preferably includes height adjustment means, e.g. a screw jack having an upper portion 25 attached to the lowermost tread support member, and a lower portion 26 attached to a mounting plate 27.

The top mounting means 15 is in the form of an angle bracket 30 having a tread support member 31 and a vertical member 32. As shown, the tread support member 31, is half the length of the tread support members 13, to provide a half step at the top of the framework. The vertical member 32 has an angle section similar to the cross-section of the tread support member 31, so that it has a flange capable of being attached to a vertical surface of a wall against which the staircase is mounted.

A connection aperture 33 and an adjustment slot 34 are provided in the top mounting means 30. In addition, a tie member 35 is provided for connection between the top mounting bracket 30 and the

uppermost tread support member 13. This tie member has a connection aperture 36 and an adjustment slot 37.

To facilitate the connection of adjacent upper chord members 16, it is preferred that alternate chord members 16 are provided with chamfered ends, so as to fit under the ends of the adjacent chord members. Thus, the chord members 16 are divided into "unders" 16a, 16c, and "overs" 16b. The apertures 21 in the "unders" and "overs" are arranged so as to coincide when the staircase is assembled.

In use, a staircase of any desired height can be constructed utilising the components of Figures 3 and 4. Thus, a five tread staircase, as shown in Figures 1 and 2, can be constructed as follows.

A pair of side frames 11 are constructed from the tread support members 13, chord members 16, 17 and bracing members 18. It is convenient to start from the lowermost tread support members 13, which is already provided with the bottom mounting means 14 attached thereto. Each side frame is assembled by interconnecting the various members with fasteners such as nuts and bolts, and leaving the fasteners relatively loose, so that the framework can be adjusted. With a pair of side frames 11 loosely constructed, the desired step size is checked to suit the available height, one of the side frames is tightened; and the other is made identical. When assembled, the staircase can be raised into position and the top and bottom mounting means moved relative to one another until the desired span and height is achieved. For example, the half step 31 can be provided below the top landing or can be provided as an extension of the top landing. Final adjustment can be taken up by the lower screw jack 14 if necessary.

The staircase can be completed by attaching the treads. In the case of a small staircase, the treads can be attached before raising it into position.

If desired, cross bracing can be provided to minimise sideways movement in larger staircases.

It will be apparent from Figure 2 that riser boards can be fitted between the treads 12, and paneling can be fitted to the side frames and to the underside of the staircase to substantially hide the framework.

Although not shown, a handrail can be readily fitted to the staircase by attaching handrail posts to the treads at suitable intervals.

It will be appreciated that the invention lends itself to the provision of a kitset framework including: a plurality of metal members which, because of their relatively short lengths compared to the overall staircase, can be readily stored or transported, enabling a home handyman to construct a staircase to his own requirements by purchasing such a kitset framework, and purchasing the required number of treads.

Instead of providing a pair of tread support members for each tread, it will be appreciated that the tread support members can be formed integral with a tread, e.g. a metal tread having side flanges forming the tread support members. This, however, is not as versatile as the pair of tread support members illustrated, as the pair of tread support members enables a stair tread of any desired width to be util-

ised with the staircase framework. Moreover, the illustrated framework enables a series of side frames to be positioned side by side to support treads or relatively great width, e.g. as used for terrace seating.

It will be appreciated that various alterations or modifications may be made to the foregoing embodiment without departing from the scope of this invention as claimed by the following claims.

It will also be appreciated that the present invention includes: a kitset framework for a staircase or terrace seating has top and bottom mounting members, a plurality of tread support members, and a plurality of chord arms and bracing members, each of relatively short length, so that a staircase can be constructed by forming a pair of side frames from these members. Each side frame is formed by pivotally connecting the members together which enables the staircase to be adjusted in situ by moving the top and bottom mounting means relative to one another to adjust the staircase span and height.

#### CLAIMS

1. A kitset framework for a staircase or terrace seating, including: top mounting means; bottom mounting means; a plurality of tread support members; a plurality of pairs of chord members, each pair of chord members being pivotally connectable at one end thereof to a respective one of said tread support members and at the other end thereof to an adjacent tread support member; whereby a framework for a staircase or terrace seating can be constructed by interconnecting a plurality of said tread support members between said top and bottom mounting means.

2. A kitset framework as claimed in claim 1, and further including a plurality of bracing members, each bracing member capable of being pivotally connected between adjacent tread support members.

3. A kitset framework as claimed in claim 1, or claim 2, wherein said tread support members are formed of angle section members.

4. A kitset framework as claimed in any one of the preceding claims, wherein said tread support members and said chord members are provided with connection apertures for the reception of fasteners, and said bracing members are provided with a connection aperture at one end thereof and an adjustment slot at the other end thereof.

5. A kitset framework as claimed in claim 4, wherein each said tread support member has a portion extending beyond said connection apertures, whereby a completed framework has tread support members which protrude from the chords of the staircase.

6. A kitset framework as claimed in any preceding claim, wherein said top mounting means is constituted by an angle bracket having a tread support member approximately half the length of the aforesaid tread support members, and a vertical limb capable of being attached to a vertical surface.

7. A kitset framework as claimed in any preceding claim, wherein said bottom mounting means includes height adjustment means.

8. A kitset framework as claimed in any preced-

ing claim, and substantially as herein described with reference to and as shown in the accompanying drawings.

9. A staircase or terrace seating constructed from the kitset framework of claim 1, including: a pair of side frames with stair treads attached at intervals to said side frames; each said side frame including: a plurality of said support members, a plurality of pairs of chord members, each pair of chord members being pivotally connected at each end thereof to adjacent tread support members, and bracing members pivotally connected between adjacent tread support members, bottom mounting means anchoring a lower end of said side frame, and top mounting means anchoring a top end of said side frame; whereby relative movement of said top and bottom mounting means will enable the angle of said staircase and thus the vertical spacing between said treads to be adjusted in situ.

10. A staircase or terrace seating as claimed in claim 9, and substantially as herein described with reference to and as shown in the accompanying drawings.

11. A kit for framework for a staircase or terrace seating, including: top and bottom mounting means; a plurality of tread support members; a plurality of chord members and a plurality of bracing members, each of said chord members and said bracing members being of sufficient length so that a staircase can be constructed by forming a pair of side frames from these members.

12. A framework assembled from a kit as claimed in claim 11, wherein each said side frame has been formed by pivotally connecting the bracing members together so as to enable the staircase to be adjusted in situ by moving the top and bottom mounting means relative to one another to adjust the staircase span and height.

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